Section 9.2 Photosynthesis: Trapping the Sun's Energy

In your textbook, read about trapping the sun's energy.

Determine if the statement is true. If it is not, rewrite the italicized part to make it true.

1. Photosynthesis is the process plants use to trap the sun's energy to make *glucose*.

2. ATP molecules are made during the *light-independent* reactions of photosynthesis.

3. *Carbon dioxide* gas is produced during photosynthesis.

4. The light-dependent reactions of photosynthesis take place in the membranes of the thylakoid discs in *mitochondria*.

5. The thylakoid membranes contain chlorophyll and other pigments that *absorb* sunlight.

In your textbook, read about the light-dependent reactions of photosynthesis.

Number the following steps of the light-dependent reactions in the order in which they occur.

_____ **6.** The energy lost by electrons as they pass through the electron transport chain is used to make ATP.

_____ **7.** The electrons pass from the chlorophyll to an electron transport chain.

_____ **8.** Sunlight strikes the chlorophyll molecules in the thylakoid membranes.

_____ **9.** $NADP^+$ molecules change to NADPH as they carry the electrons to the stroma of the chloroplast.

_____ **10.** The sunlight's energy is transferred to the chlorophyll's electrons.

_____ **11.** The electrons are passed down a second electron transport chain.

Answer the following questions.

12. How are the electrons that are lost by the chlorophyll molecules replaced?

13. How do plants produce oxygen during photosynthesis?

In your textbook, read about the light-independent reactions.

Circle the letter of the choice that best completes the statement or answers the question.

14. The Calvin cycle includes
- **a.** the light-dependent reactions.
- **b.** an electron transport chain.
- **c.** the light-independent reactions.
- **d.** photolysis.

15. The Calvin cycle takes place in the
- **a.** mitochondria.
- **b.** stroma.
- **c.** nucleus.
- **c.** thylakoid membrane.

16. What product of the light-dependent reactions is used in the Calvin cycle?
- **a.** oxygen
- **b.** carbon dioxide
- **c.** NADPH
- **d.** chlorophyll

17. What gas is used in the first step of the Calvin cycle?
- **a.** oxygen
- **b.** carbon dioxide
- **c.** hydrogen
- **d.** water

18. A carbon atom from carbon dioxide is used to change the five-carbon sugar RuBP into
- **a.** ATP.
- **b.** two molecules.
- **c.** PGA.
- **d.** a six-carbon sugar.

19. How many molecules of the three-carbon sugar PGA are formed?
- **a.** two
- **b.** one
- **c.** six
- **d.** three

20. ATP, NADPH, and hydrogen ions are used to convert PGA into
- **a.** PGAL.
- **b.** glucose.
- **c.** RuBP.
- **d.** carbon dioxide.

21. How many rounds of the Calvin cycle are needed to form one glucose molecule?
- **a.** one
- **b.** six
- **c.** two
- **d.** three

22. What two molecules leave the Calvin cycle and are combined to form glucose?
- **a.** RuBP
- **b.** PGA
- **c.** PGAL
- **d.** CO_2

23. Which molecule from the Calvin cycle is used to replenish the five-carbon sugar, RuBP, which is used at the beginning of the cycle?
- **a.** NADP
- **b.** CO_2
- **c.** PGA
- **d.** PGAL